



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,324	09/18/2003	Motomu Hashizume	TI-36027 / DDM03-020	6245

23494 7590 05/31/2006

TEXAS INSTRUMENTS INCORPORATED  
P O BOX 655474, M/S 3999  
DALLAS, TX 75265

EXAMINER

DAVIDSON, DAN

ART UNIT PAPER NUMBER

2627

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/665,324

Applicant(s)

HASHIZUME ET AL.

Examiner

Dan I. Davidson

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 February 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-8,10-12 and 14-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-8,10-12 and 14-16 is/are rejected.
- 7) ☒ Claim(s) 2-4,7,10-12 and 14-16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 February 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s).**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. The amendment filed February 21, 2006 has been received and has been made of record. An Office Action in response to the above amendment follows. Since this Action contains rejections not necessitated by amendment, this Action will not be final.

2. Claims 1, 9, and 13 have been canceled.

### ***Specification***

3. The disclosure is objected to because of the following informalities:

(1) On page 5, line 22, --first logic level-- should be inserted prior to "current mirror" for consistency with claim 10.

(2) On page 5, line 23, --second logic level-- should be inserted prior to "current mirror" for consistency with claim 10.

(3) On page 6, line 26, --(a first boost current mirror)-- should be inserted after "secondary current mirror 154" for consistency with claim 11.

(4) On page 6, line 27, --(a second boost current mirror)-- should be inserted after "secondary current mirror 156" for consistency with claim 11.

(5) On page 6, line 27, "154" should be replaced with --156--.

(6) On page 7, line 5, "100" should be replaced with --150--.

(7) On page 7, line 17, "117" should be replaced with --177--.

(8) On page 8, line 20, "78" should be replaced with --79--.

(9) On page 9, line 7, --252-- should be inserted after "secondary current mirror."

(10) On page 9, line 8, --256-- should be inserted after "secondary current mirror."

(11) On page 9, line 13, --250-- should be inserted after "current mirror."

(12) On page 9, line 25, --277-- should be inserted after "gate locus."

Appropriate correction is required.

### ***Drawings***

4. The drawings were received on February 21, 2006. These drawings are not acceptable since the replacement Figure 2 does not have the phrase "Replacement Sheet" placed at its top margin and because the replacement Figure 2 does not show every feature of the claimed invention. See 37 C.F.R. § 1.83. See 37 C.F.R. § 1.121(d).

5. The drawings are objected to because element 252 is not noted in original Figure 2 and the impedance matching block in original Figure 2 should be referred to by the number 42 instead of 82. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either

Art Unit: 2627

"Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

6. Claims 2-4, 7, 10-12, and 14-16 are objected to because of the following informalities:

- (1) The claim limitations at claim 2, lines 2-5 are identical with the claim limitations at its parent claim 3, lines 12-14. Thus, the limitations are repetitive and should be deleted.
- (2) In claim 3, line 14, and in claim 4, line 13, "similarly with" should be replaced with --similar to--.
- (3) Claim 7 is objected to since it is identical to claim 5 (including its dependency on claim 3).
- (4) In claim 10, line 3, "are substantially similar in construction" is a claim limitation that repeats a claim limitation already provided at parent claim 11, lines 17-18. Thus, the limitation is repetitive and should be deleted.
- (5) In claim 10, line 4, the phrases "first logic level current mirror" and "second logic level current mirror" do not appear in the specification.
- (6) In claim 10, line 5, "mirror" should be replaced with --mirrors--.

Art Unit: 2627

(7) In claim 10, line 7, for the purpose of consistency with the specification and claims 2 and 4, "logic level write drive signal" should be replaced with --direct current write current signal--.

(8) In claim 11, lines 18 and 19, the phrases "first boost current mirror" and "second burst current mirror" do not appear in the specification.

(9) In claim 11, line 18, the last "and" should be deleted.

(10) In claim 11, lines 19 and 21, the last "mirror" should be replaced with --mirrors--.

(11) In claim 11, line 22, for the purpose of consistency with the specification and claims 3-4, "said boost current write drive component signal" should be replaced with --a write boost current signal--.

(12) Claims 12 and 14-16 are objected to for having the same deficiencies as those listed above with respect to claims 10 and 11.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 2-8, 10-12, and 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(1) In claims 3 and 4, the paragraph beginning with "said control unit" does not distinctly claim the invention's subject matter. In order to overcome this rejection, the

Art Unit: 2627

Examiner recommends claiming first and second drive signals and clearly claiming the relationship between the first and second drive signals. Claims 2 and 5-8 are rejected since they depend on either claim 3 or 4.

(2) In claim 10, lines 5-6, "logic level write drive component signal" does not appear in the specification and it is unclear whether this refers to signals WDHX1 and WDLX1 or whether it refers to signal  $I_{WDC}$ . This lack of clarity is further compounded by the immediately following phrase "responding to said control signals." Based on page 4, lines 7-9 of the specification, "control signals" appears to include WDHX1 and WDLX1. To which "control signals" is Applicant referring in the claim?

(3) In claim 11, line 20, the term "boost current write drive component signal" does not appear in the specification and it is unclear whether this refers to signals BSTHX1 and BSTLX1 or whether it refers to signal  $I_{BSTREF}$ . This lack of clarity is further compounded by the phrase "responding to said control signals" that appears on the following line. Based on page 4, lines 7-9 of the specification, "control signals" appears to include BSTHX1 and BSTLX1. To which "control signals" is Applicant referring in the claim?

(4) In claim 11, lines 22-25, the phrase beginning with "in the same signal polarity" is confusing and does not lend itself to a definite interpretation.

(5) Claims 12 and 14-16 are indefinite for the reasons provided above with respect to claims 10 and 11.

Art Unit: 2627

9. Claims 2-8, 10-12, and 14-16 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

The claims would be allowable over the prior art of record, and in particular Voorman et al (US 5,668,676 A), for the reasons provided in the Office Action mailed October 5, 2005.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bloodworth et al (US 2005/0007686 A1) teach that the voltage across a write head is pulled toward a first polarity based on a first write signal and toward a second polarity based on a second write signal, wherein the voltage pulled toward the first polarity and the voltage pulled toward the second polarity are substantially centered about a common mode voltage.

VanEaton et al (US 2004/0196582 A1) teach directing a write current to establish a write voltage across a write head in a first excursion in response to a first write signal and in a second excursion in response to a second write signal, wherein the first and second excursions occur about a common mode voltage.

Alini et al (US 6,512,649 B1) teach a circuit that allows for a common mode voltage of a write head to be substantially constant over time.



Art Unit: 2627

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan I. Davidson whose telephone number is (571) 272-7552. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea L. Wellington, can be reached on (571) 272-4483. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DID  
Dan I Davidson.  
May 24, 2006

  
ANDREA WELLINGTON  
SUPERVISORY PATENT EXAMINER